STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	1	23
Plotting Date: 08/15/2017			

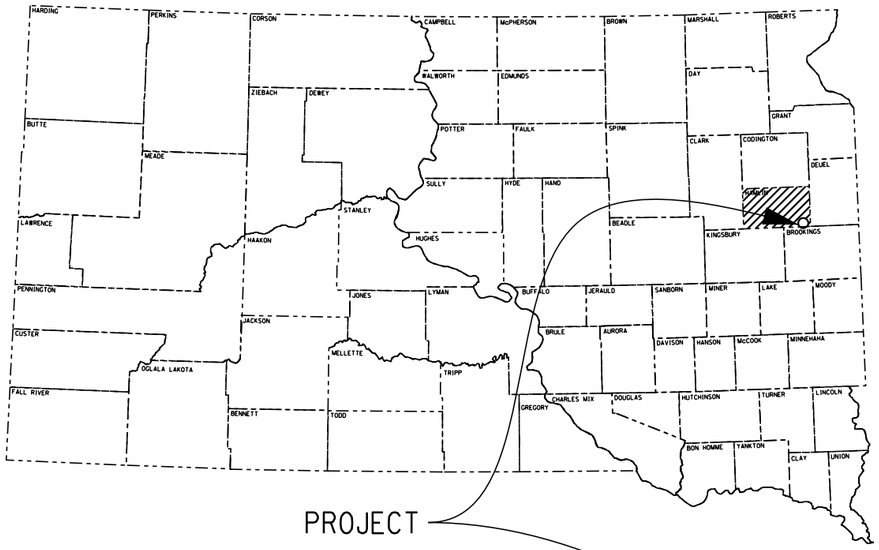
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION

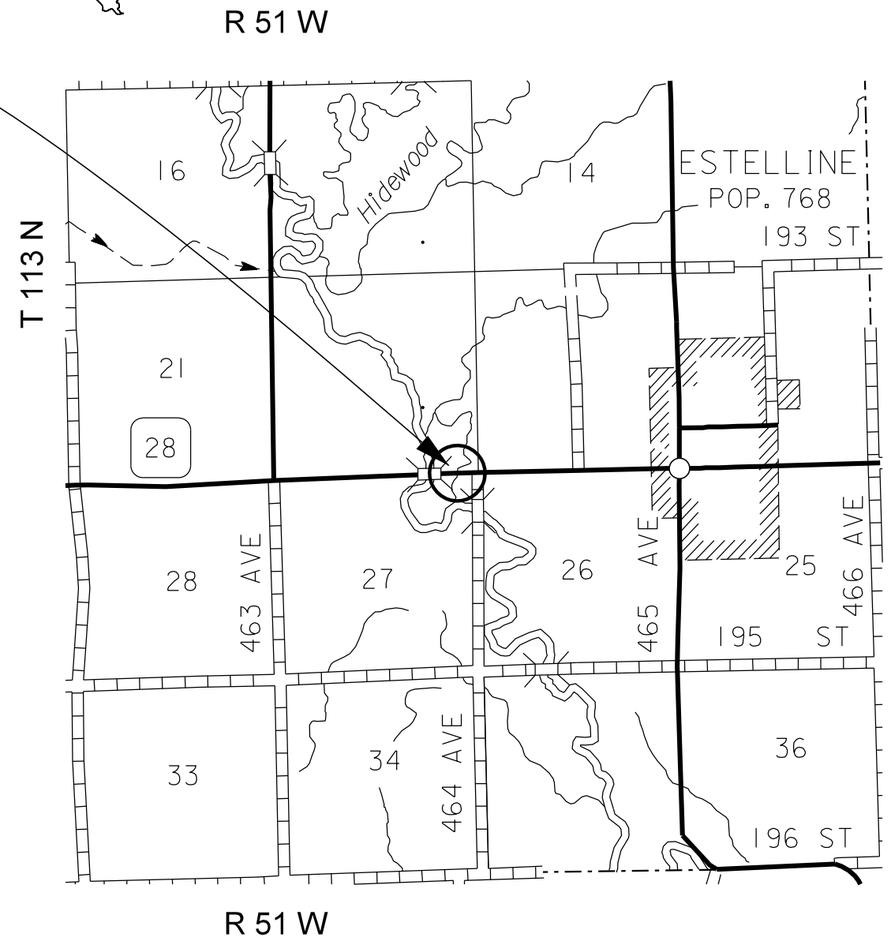
PLANS FOR PROPOSED

PROJECT 028–171
SD HIGHWAY 28
HAMLIN COUNTY

CULVERT REPLACEMENT
PCN i4XE

INDEX OF SHEETS





DESIGN DESIGNATION

ADT (2016)	1119
ADT (2036)	1348
DHV	152
D	52%
T DHV	4.3%
T ADT	9.4%
V	65 MPH

STORM WATER PERMIT

None Required

ESTIMATE OF QUANTITIES AND ENVIRONMENTAL COMMITMENTS

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ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
004E0010	Blading	10	Hour
009E0010	Mobilization	Lump Sum	LS
110E1690	Remove Sediment	0.3	CuYd
110E1700	Remove Silt Fence	125	Ft
120E0010	Unclassified Excavation	1,932	CuYd
120E0600	Contractor Furnished Borrow Excavation	645	CuYd
205E0010	Dust Control Chloride	45,056	Lb
230E0100	Remove and Replace Topsoil	Lump Sum	LS
250E0020	Incidental Work, Grading	Lump Sum	LS
260E1010	Base Course	455.0	Ton
320E1200	Asphalt Concrete Composite	130.0	Ton
421E0100	Pipe Culvert Undercut	213	CuYd
450E0202	48" RCP Class 2, Furnish	256	Ft
450E0210	48" RCP, Install	256	Ft
450E2036	48" RCP Flared End, Furnish	8	Each
450E2037	48" RCP Flared End, Install	8	Each
464E0100	Controlled Density Fill	180.6	CuYd
600E0100	Type I Field Laboratory	1	Each
633E1400	Pavement Marking Paint, 4" White	1,000	Ft
633E1405	Pavement Marking Paint, 4" Yellow	125	Ft
634E0010	Flagging	5.0	Hour
634E0110	Traffic Control Signs	273.8	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0265	Type 3 Barricade, 6' Double Sided	2	Each
634E0280	Type 3 Barricade, 8' Single Sided	10	Each
634E0640	Temporary Pavement Marking	240	Ft
634E1002	Detour Signing	248.4	SqFt
730E0204	Type C Permanent Seed Mixture	11	Lb
732E0100	Mulching	2.2	Ton
734E0154	12" Diameter Erosion Control Wattle	100	Ft
734E0604	High Flow Silt Fence	500	Ft
734E0610	Mucking Silt Fence	35	CuYd
734E0620	Repair Silt Fence	125	Ft
734E5005	Dewatering	Lump Sum	LS
831E0300	Reinforcement Fabric (MSE)	460	SqYd

SPECIFICATIONS

Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

ENVIRONMENTAL COMMITMENTS

An Environmental Commitment is a measure that SDDOT commits to implement in order to avoid, minimize, and/or mitigate a real or potential environmental impact. Environmental commitments to various agencies and the public have been made to secure approval of this project. An agency mentioned below with permitting authority can influence a project if perceived environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor's primary contact regarding matters associated with these commitments will be the Project Engineer. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office. The environmental commitments associated with this project are as follows:

COMMITMENT B: FEDERALLY THREATENED, ENDANGERED, AND PROTECTED SPECIES

COMMITMENT B2: WHOOPING CRANE

The Whooping Crane is a spring and fall migratory bird in South Dakota that is about 5 feet tall and typically stops on wetlands, rivers, and agricultural lands along their migration route. An adult Whooping Crane is white with a red crown and a long, dark, pointed bill. Immature Whooping Cranes are cinnamon brown. While in flight, their long necks are kept straight and their long dark legs trail behind. Adult Whooping Cranes' black wing tips are visible during flight.

Action Taken/Required:

Harassment or other measures to cause the Whooping Crane to leave the site is a violation of the Endangered Species Act. If a Whooping Crane is sighted roosting in the vicinity of the project, borrow pit, or staging site associated with the project, cease construction activities in the affected area until the Whooping Crane departs and contact the Project Engineer. The Project Engineer will contact the Environmental Office so that the sighting can be reported to USFWS.

COMMITMENT C: WATER SOURCE

The Contractor shall not withdraw water with equipment previously used outside the State of South Dakota without prior approval from the SDDOT Environmental Office. Thoroughly wash all construction equipment before entering South Dakota to reduce the risk of invasive species introduction into the project vicinity.

The Contractor shall not withdraw water directly from streams of the James, Big Sioux, and Vermillion watersheds without prior approval from the SDDOT Environmental Office.

Action Taken/Required:

The Contractor shall obtain the necessary permits from the regulatory agencies such as the Department of Environment and Natural Resources (DENR) and the United States Army Corps of Engineers (COE) prior to executing water extraction activities.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

ENVIRONMENTAL COMMITMENTS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
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COMMITMENT H: WASTE DISPOSAL SITE

The Contractor shall furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) shall be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Environment and Natural Resources.

The waste disposal site(s) shall not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements shall apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials shall be buried in a trench completely separate from wood debris. The final cover over the construction and/or demolition debris shall consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW shall be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor shall control the access to waste disposal sites not within the Public ROW through the use of fences, gates, and placement of a sign or signs at the entrance to the site stating “No Dumping Allowed”.

2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period of time not to exceed the duration of the project. Prior to project completion, the waste shall be removed from view of the ROW or buried and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06.

Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) shall be incidental to the various contract items.

COMMITMENT I: HISTORICAL PRESERVATION OFFICE CLEARANCES

The SDDOT has obtained concurrence with the State Historical Preservation Office (SHPO or THPO) for all work included within the project limits and all department designated sources and designated option material sources, stockpile sites, storage areas, and waste sites provided within the plans.

Action Taken/Required:

All earth disturbing activities not designated within the plans require review of cultural resources impacts. This work includes, but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor shall arrange and pay for a cultural resource survey and/or records search. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor shall provide ARC with the following: a topographical map or aerial view on which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor shall submit the records search or cultural resources survey report and if the location of the site is within the current geographical or historic boundaries of any South Dakota reservation to SDDOT Environmental Engineer, 700 East Broadway Avenue, Pierre, SD 57501-2586 (605-773-3180). SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

If evidence for cultural resources is uncovered during project construction activities, then such activities shall cease and the Project Engineer shall be immediately notified. The Project Engineer will contact the SDDOT Environmental Engineer in order to determine an appropriate course of action.

SHPO/THPO review does not relieve the Contractor of the responsibility for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor shall provide the required permits and clearances to the Project Engineer at the preconstruction meeting.

COMMITMENT N: SECTION 404 PERMIT

The SDDOT has obtained a Section 404 Permit from the US Army Corps of Engineers for the permanent actions associated with this project.

Action Taken/Required:

The Contractor shall comply with all requirements contained in the Section 404 permit.

The Contractor shall also be responsible for obtaining a Section 404 permit for any dredge, excavation, or fill activities associated with staging areas, borrow sites, waste disposal sites, or material processing sites that affect wetlands or waters of the United States.

PLOT SCALE - 1:5.00001

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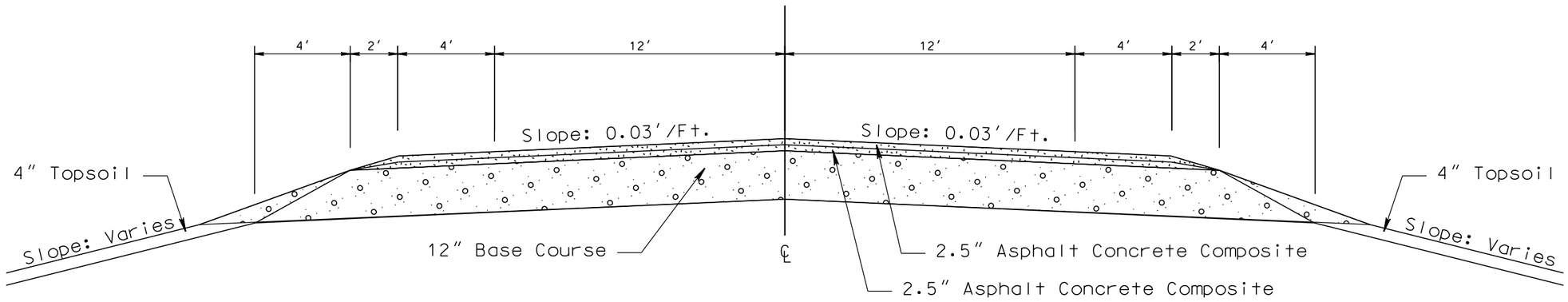
TYPICAL SECTION

Mainline

Sta. 815+63 to Sta. 816+83



Typical Section may need to be adjusted to match existing surfacing and subgrade widths

PLOTTED FROM - TRAB10200

PLOT NAME - 2

FILE -...\14XE TYPICAL SECTION.DGN

SURFACING THICKNESS DIMENSIONS

Plans tonnage will be applied even though the thickness may vary from that shown on the plans.

At those locations where material must be placed to achieve a required elevation, plans quantities may be varied to achieve the required elevation.

SEQUENCE OF OPERATIONS

1) Install Traffic Control and Detour Route Signing.
2) Close SD28 to traffic.
3) Install Sediment and Erosion Control Measures.
4) Remove Surfacing, Excavate and Remove Culverts.
5) Complete Pipe Culvert Undercut and Culvert Cradling.
6) Install Culverts.
7) Place Controlled Density Fill and Begin Backfilling.
8) Complete Backfilling of Culvert and Roadway Excavation.
9) Place Base Course, MSE and Asphalt Concrete Composite.
10) Remove Traffic Control Signing, Open Roadway to Traffic and Remove Detour Route Signing.
11) Complete Pavement Markings, Project Cleanup and place Final Erosion Control.

* Placement of the Flush Seal and Permanent Pavement Markings may be completed after the roadway is open to traffic.

UTILITIES

Utilities are not planned to be affected on this project. If utilities are identified near the improvement area through the SD One Call Process as required by South Dakota Codified Law 49-7A and Administrative Rule Article 20:25, the contractor shall contact the project engineer to determine modifications that will be necessary to avoid utility impacts.

TYPE I FIELD LABORATORY

The lab shall be equipped with an internet connection such as DSL, cable modem, or other approved service. The internet connection shall be provided with a multi-port wireless router. The internet connection shall be a minimum speed of 512 Kb unless limited by job location and approved by the DOT. Prior to installing the wireless router the Contractor shall submit the wireless router's technical data to the Area Office to check for compatibility with the state's computer equipment. The internet connection is intended for state personnel usage only. The Contractor's personnel are prohibited from using the internet connection unless pre-approved by the Project Engineer. These items shall be incidental to the contract unit price per each for TYPE I FIELD LABORATORY.

TRAFFIC CONTROL

The culver repair site shall be closed traffic to expedite construction. A detour on local roads has been provided within these plans. Access to Field Entrances shall be maintained at all times.

Removing, relocating, covering, salvaging and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Cost of this work shall be incidental to the various contract items unless otherwise specified in the plans. Delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the State.

A quantity of 4 Stop Signs has been included for use on the detour route with placement to be determined by the Engineer.

Indiscriminate driving and parking of vehicles within the right-of-way will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the State, and to the satisfaction of the Engineer.

Work activities during non-daylight hours are subject to prior approval.

Traffic Control signs, as shown in the Itemized List for Traffic Control Signs, are estimates. Contractor's operation may require adjustments in quantities, either more or less. Payment will be for those signs actually ordered by the Engineer and used.

DEWATERING

The pipe shall be installed in dry bedding. If water is present, dewatering will be required. One possible option for dewatering is placing sandbags wrapped in 6 mil polyethylene sheeting around the culvert replacement area and dewatered before construction activities can begin. All costs associated with dewatering such as sandbagging shall be incidental to the contract unit lump sum price for DEWATERING.

If dewatering is necessary, the Contactor has the option to use sediment laden water trapped within the project limits to irrigate vegetation and seed, or the Contractor may elect to pump sediment laden water onto a densely vegetated relatively flat area. Sediment laden water shall remain within the right of way unless the Contractor receives permission from adjacent landowner's to irrigate or release sediment laden water onto their properties. Water must be released a minimum of 100 feet away from all waterways and must be pumped and released or applied in such a manner that it does not cause erosion. Dewatering and all incidentals will be paid for at the contract lump sum price for DEWATERING.

SHRINKAGE FACTOR: +30%

MAINLINE CROSS PIPE REPLACEMENT

After the existing pipe has been removed, the new pipe culvert shall be undercut to a minimum depth of 2 feet. The depth of undercut is an estimate and the actual depth necessary shall be determined during construction. The Engineer will determine how much undercut shall be done in accordance with Section 421 of the Standard Specifications, but will not reduce the undercut to less than 2 feet in depth.

Material for backfilling the undercut area shall conform to the gradation requirements of Base Course in Section 882. All other requirements of Section 421 shall apply.

Pipe culverts will be bedded in accordance with Section 450.3.F.2, Class B Bedding with the following exceptions. The undercut area shall extend 2 feet from the outermost diameter on both sides of the pipe with the back of the excavated area being sloped 3:1 upward to the top of the roadway surface. The Select Fill Material for the Class B Bedding Material shall conform to the gradation requirements of Base Course in Section 882. See 4-48" Culvert Replacement Detail.

After the minimum testing requirements of M.S.T.R Section 4.1.F.3.a.1 (SDDOT Materials Manual) have been met, the minimum density testing requirements shall be one test per zone. Each zone shall be 2 feet in depth. Moisture testing shall remain as per M.S.T.R.

The remainder of the pipe culvert excavation shall be backfilled with soils taken from the pipe removal excavation or other suitable material as approved by the Engineer. The backfill will be benched into 3:1 excavation slope. Compaction of the backfill material shall be governed by the Specified Density Method.

Controlled Density Fill shall be placed between the culvert barrels. Controlled Density Fill shall extend to the edge of the inslope and shall be placed to match the slope of the flared ends of the RCP culverts. This will require formwork to contain and properly shape the Controlled Density Fill between the Flared Ends.

Placement of Select Fill Material, Soil Backfill and Controlled Density Fill shall be staged as follows:

1. Place Select Fill Material to 30% of pipe diameter as shown on 4-48" Culvert Replacement Detail.
2. Place Controlled Density Fill between culvert barrel sections, to a height of 33% of pipe diameter.
3. Place soil backfill to a height of 66% of pipe diameter.
4. Place Controlled Density Fill between culvert barrel sections, to a height of 66% of pipe diameter.
5. Place Controlled Density Fill between culvert barrel sections, to the top of the culverts.
6. Complete remainder of soil backfill.

* Placement of Select Fill Material, Soil Backfill and Controlled Density Fill may be done is shallower lifts then stated above.

After the new pipe has been backfilled to the top of the subgrade, a 12" depth of base course and 5" depth (2- 2.5" lifts) of asphalt concrete composite shall be placed as a patch matching the existing asphalt concrete. See 4-48" Culvert Replacement Detail.

MAINLINE CROSS PIPE REPLACEMENT (CONT.)

All costs to saw cut asphalt, remove and dispose of asphalt, excavate and backfill the material to the bottom of the pipe and slope the excavating limits at a 3:1 backslope shall be paid for at the contract unit price per cubic yard for Unclassified Excavation. No additional payment will be made for asphalt removal, excavation, or disposal of material to accommodate temporary channel diversions or pipes. The cost for asphalt concrete composite installed over the pipe replacement shall be paid for at the contract unit price per ton for ASPHALT CONCRETE COMPOSITE.

Pipe flowlines shall match that of existing pipe. Elevations shown on pipe cross sections may need to be adjusted, as culvert end sections have separated and moved away from the barrel sections. Ditches may need to be excavated in each direction from the pipe ends to maintain proper water flow through the pipe. The excavated material shall become the property of the Contractor for his disposal. All costs associated with this work shall be incidental to the contract lump sum price for INCIDENTAL WORK, GRADING.

It is anticipated that 2/3 of the subgrade material will be stockpiled and used to backfill the trench. All remaining material generated from the removal of the base course and subgrade shall become property of the Contractor. All costs associated with these activities shall be incidental to the contract unit price per cubic yard for UNCLASSIFIED EXCAVATION.

Salvage or granular material will not be allowed for backfill in the subgrade.

CONTROLLED DENSITY FILL FOR PIPE

Controlled density fill shall be in conformance with Section 464 of the Specifications.

TABLE OF CONTROLLED DENSITY FILL FOR PIPE

Station	Quantity (CuYd)
816+14	60.2
816+23	60.2
816+32	60.2
Total:	180.6

CONTRACTOR FURNISHED BORROW EXCAVATION

The Contractor shall provide a suitable site for Contractor furnished borrow excavation material. The Contractor is responsible for obtaining all required permits and clearances for the borrow site. The borrow material shall be approved by the Engineer.

Restoration of the Contractor furnished borrow excavation site shall be the responsibility of the Contractor.

A quantity of 645 Cu.Yd. of Contractor Furnished Borrow Excavation is being established with the anticipation that some of the subgrade material excavated may not be suitable for reuse in completing this project.

REINFORCEMENT FABRIC (MSE)

460 square yards of Reinforcement Fabric (MSE) should be included in the materials quantities for bidding purposes. This quantity is assumed to cover 400 sq. yds. The bid quantity has been increased by 15% to account for overlaps.

The top of the subgrade shall be prepared by smoothing the surface of the subgrade to minimize any ruts, ridges, and depressions. Any rocks or other protrusions that might damage the fabric will be removed. The fabric will unrolled perpendicular to the centerline and overlapped a minimum of 2 feet.

The fabric will be placed as taut as possible with minimal wrinkles. Placement will be done so that subsequent granular cover material does not shove, wrinkle or distort the in place fabric. The overlaps will be shingled in a manner that assures granular material will not be forced under the fabric during backfilling operations. The fabric may be held in place with small piles of granular material or staples. No traffic will be allowed on the uncovered fabric.

Granular material will be dumped at least 20 feet behind the leading edge of the backfill and pushed into place with a loader or dozer from the covered areas to the uncovered areas. The granular material will be placed as two 6 inch lift or as directed by the Engineer. The granular material will be compacted to 97% maximum dry density as determined by the Specified Density Method.

Reinforcement Fabric (MSE) Specification:

The fabric will conform to the specification for Geotextiles and Impermeable Plastic Membrane, Reinforcement Fabric (MSE) (Section 831 of the Specifications). The fabric will be on the Approved Products List for this material or will be certified by the supplier to meet this specification prior to installation.

Fabric will be paid for at the contract unit price per square yard for REINFORCEMENT FABRIC (MSE). Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the fabric only. Select Fill Materials will be paid for under a separate bid item.

REMOVE AND REPLACE TOPSOIL

Topsoil shall also be salvaged and stockpiled from the inslopes of the culvert replacement project site. Limits of this work, depth of salvage, and stockpile location will be directed by the Engineer. Following completion of construction, topsoil shall be spread evenly over the disturbed areas.

All costs associated with removing and replacing the topsoil along areas to be resurfaced shall be incidental to the contract lump sum price for REMOVE AND REPLACE TOPSOIL.

WATER FOR COMPACTION OF GRANULAR MATERIALS

Cost of water for compaction of the granular material shall be incidental to the contract unit price for the various contract items. Six percent, plus or minus, moisture will be required at the time of compaction unless otherwise directed by the Engineer.

TABLE OF BASE COURSE

Location/Item	Quantity (Ton)
Culvert Backfill – lower 15% of pipe diameter	81
Culvert Backfill – upper 15% of pipe diameter at ends of excavation	34
12” of Surfacing	340
TOTAL	**455**

TEMPORARY AND PERMANENT PAVEMENT MARKINGS

Temporary Flexible Vertical Markers (Tabs) shall be used to mark dashed centerline, No Passing Zones and applicable lane lines on the wear course or after application of the Flush Seal. Paint will not be allowed for Temporary Pavement Marking on the Asphalt Concrete Composite wear course or after application of the Flush Seal.

TEMPORARY PAVEMENT MARKINGS

The total length of no passing zone on this project is estimated to be **0.0** miles.

Quantities of Temporary Pavement Markings consist of:

One pass on top of the Asphalt Concrete.
One pass on top of the Flush Seal.

If the Flush Seal is eliminated, the application of the Temporary Pavement Marking on top of the Flush Seal will be eliminated. No adjustment in the contract unit price for Temporary Pavement Marking will be made because of a variation in quantities.

Temporary Flexible Vertical Markers (Tabs) may be used as detailed in the Specifications. Covers on the tabs shall be sufficiently secured to prevent traffic from dislodging the cover and when removed the covers shall be properly disposed. The Contractor shall remove and properly dispose of the tabs after Permanent Pavement Marking is applied. Method of removal shall be nondestructive to the road surface and shall be accomplished within one week of completion of the Permanent Pavement Marking.

Any tabs with covers removed before the Flush Seal shall be replaced prior to Flush Seal application.

Cost for furnishing, applying, removing and disposing of the Temporary Flexible Vertical Markers (Tabs) shall be included in the contract unit price per mile for Temporary Pavement Marking.

Flagger symbol signs (W20-7) and flaggers, or a shadow vehicle with rotating yellow lights or strobe lights shall be positioned on the roadway shoulder in advance of workers for both directions of traffic during the installation of temporary road markers. The traffic control device used shall be moved to provide proper warning of the work operation. A ROAD WORK AHEAD (W20-1), a Workers symbol sign (W21-1) or a BE PREPARED TO STOP (W3-4) warning sign shall be mounted on the rear of the shadow vehicle. The method of traffic control used by the Contractor for this work shall be approved by the Engineer.

INCIDENTAL WORK, GRADING

Station	L/R	Remarks
816+10	L&R	Culvert Removal & Ditch Cleanout
816+18	L&R	Culvert Removal & Ditch Cleanout
816+27	L&R	Culvert Removal & Ditch Cleanout
816+36	L&R	Culvert Removal & Ditch Cleanout

PERMANENT PAVEMENT MARKING

The quantity of permanent pavement markings is sufficient to cover an additional 190’ of pavement on each side of the new pavement.

Traffic Control shall be incidental to the cost of application. The striper and advance or trailing warning vehicle shall be equipped with flashing amber lights or advance warning arrow panel.

All materials shall be applied as per manufacturer’s recommendations.

The application of Permanent Pavement Marking paint may not begin until 7 calendar days following completion of final surfacing (including Flush Seal if applied) and shall be completed within 14 calendar days following completion of the final surfacing.

For each working day the application of permanent pavement marking paint remains uncompleted beyond the time limits described in the preceding paragraph, the Contractor will be assessed liquidated damages at the rate of $250.00 per day.

The liquidated damages shall apply up to the expiration of the contract time requirement in which the permanent pavement markings are required to be completed, including any formally approved time extensions. Following the expiration of the contract time requirement in which the permanent pavement markings are required to be completed, including any formally approved time extensions, liquidated damages will be assessed in accordance with Section 8.8 of the Specifications.

COLD WEATHER WATERBORNE PAINT

Waterborne paint applied after October 15 shall be formulated as cold-weather waterborne paint and shall be applied in accordance with the manufacturer’s recommendations, including minimum temperature requirements.

Cold-weather waterborne paint shall conform to Section 980 of the Specifications except for the following:

980.1: Resin Binder shall be FASTRACK™ XSR™ manufactured by Dow, or an approved equal.

980.1 A. Quantitative Requirements:

Pigment, percent by weight; tested in accordance with ASTM D3723: 58.0 to 62.5 for white and 56.1 to 62.0 for yellow.

Non-volatile Vehicle, percent by weight; tested in accordance with NIST 141C (Method 4051.1): 41.5 minimum for white and 41.5 minimum for yellow.

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow of runoff and sediment shall be installed at locations noted in the table and at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contractor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

Erosion control wattles shall remain on the project to decompose.

An additional quantity of 12” Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels and as an alternative to low flow or high flow silt fence at wetland areas adjacent to the highway.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

TABLE OF EROSION CONTROL WATTLE

Station	L/R	Diameter (Inch)	Location	Quantity (Ft)
816+00 to 816+50	L	12	Inlet of Culverts	70
			Additional Quantity:	30
			Total:	100

HIGH FLOW SILT FENCE

The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

http://sddot.com/business/certification/products/Default.aspx

High flow silt fence shall be placed at the locations noted in the table and at locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

An additional quantity of high flow silt fence has been added to the Estimate of Quantities for temporary sediment control.

TABLE OF HIGH FLOW SILT FENCE

Station	L/R	Location	Quantity (Ft)
815+23 to 817+23	L	Protection of upstream wetlands	240
815+23 to 817+23	R	Downstream Channel Protection	240
		Additional Quantity:	20
		Total:	500

MYCORRHIZAL INOCULUM

Mycorrhizal inoculum shall consist of mycorrhizal fungi spores and mycorrhizal fungi-infected root fragments in a solid carrier. The carrier may include organic materials, calcinated clay, or other materials consistent with application and good plant growth. The supplier shall provide certification of the fungal species claimed and the live propagule count. The inoculum shall include the following fungal species:

Glomus intraradices	25%
Glomus aggregatu	25%
Glomus mosseae	25%
Glomus etunicatum	25%

All seed shall be inoculated by the seed supplier with a minimum of 100,000 live propagules of mycorrhizal fungi per acre. All costs of inoculating the seed shall be incidental to the contract unit price per pound for the corresponding permanent seed mixture.

The mycorrhizal inoculum shall be as shown below or an approved equal:

Product	Manufacturer
MycoApply	Mycorrhizal Applications, Inc. Grants Pass, OR Phone: 1-866-476-7800 www.mycorrhizae.com

FERTILIZING

Application of fertilizer will not be required on this project.

PERMANENT SEEDING

The areas to be seeded consist of all newly graded areas within the project limits except for the top of roadways.

The estimates area to seed is 0.6 acres. This is based upon a disturbed area 250 ft long and 50 ft wide on each side of the roadway. Basis of payment will be plans quantity.

Type C Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana, Walsh	16
Canada Wildrye	Mandan	2
	Total:	18

MULCHING (GRASS HAY OR STRAW)

An additional 1 tons of Grass Hay or Straw Mulch has been added to the Estimate of Quantities for temporary erosion control on areas determined by the Engineer during construction.

BLADING

The Contractor shall provide a blade and operator for the purpose of maintaining a smooth and passable detour route for traffic as determined by the Engineer. Maintenance of traffic shall be the blade and operator's main priority. The cost for blading the detour route road for maintenance of traffic shall be paid at the contract unit price per hour for BLADING.

DUST CONTROL CHLORIDE

The Contractor shall provide a magnesium chloride solution to the gravel portion of the detour route (3.0 miles). Dust Control shall be applied 26 feet wide on the North-South gravel road and 20 feet wide on the East-West & North-South Township road.

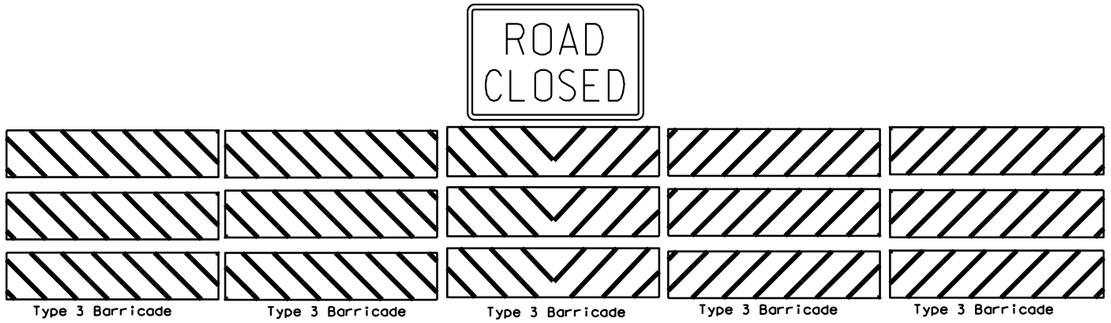
Each application of dust control shall be rolled with a pneumatic roller for a minimum of 3 coverages.

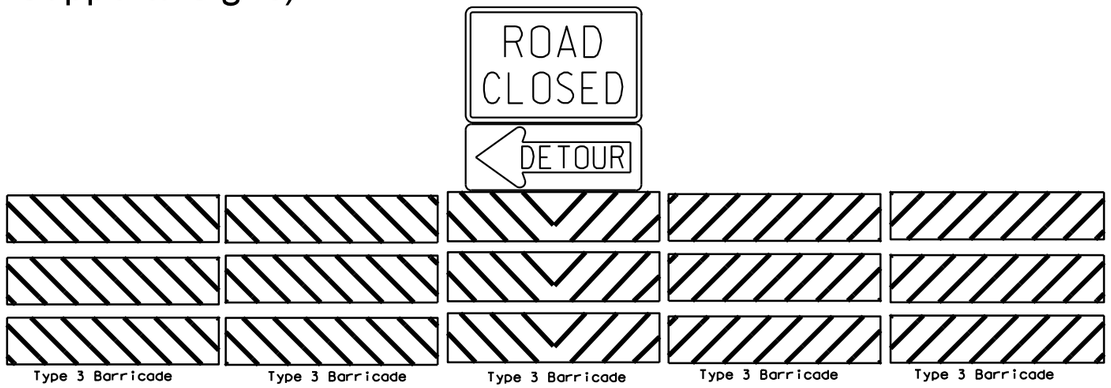
PLOT SCALE - 1:4200

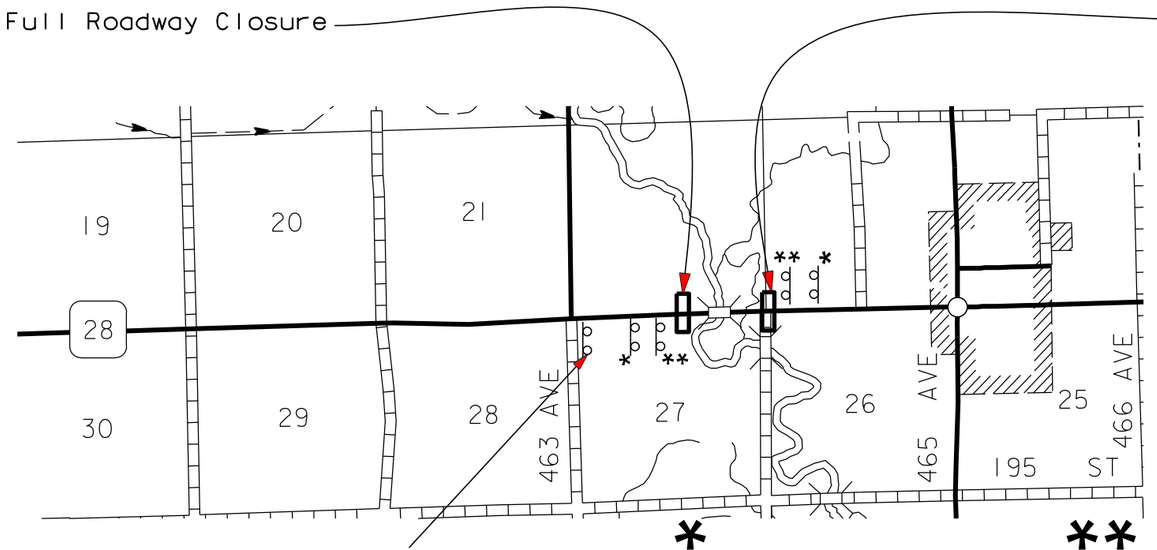
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	9	23
Plotting Date: 08/16/2017			

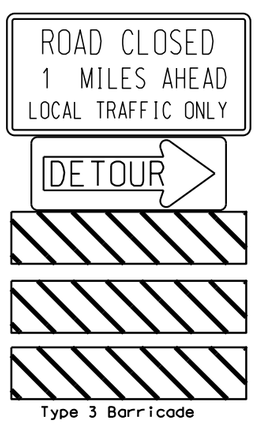
ROAD CLOSURE SIGN LAYOUT

(Fixed Location, Ground Mounted, Breakaway Supports Signs)









All Type 3 Barricades with a
"Road Closed xx Miles Ahead Local Traffic Only"
sign shall be 6' wide and Double Sided.

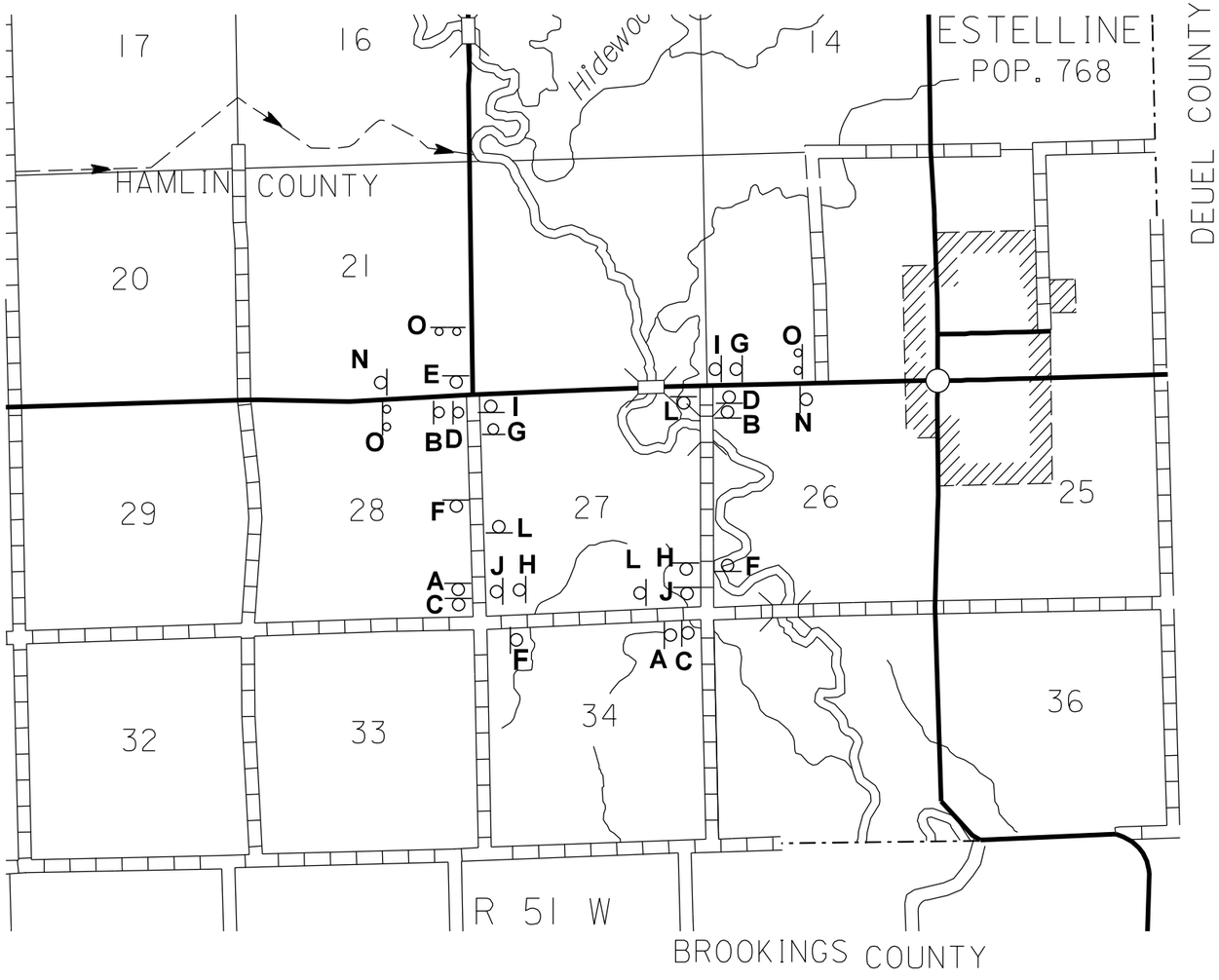
PLOTTED FROM - TRAB10200
PLOT NAME - 1
FILE - ...\PRJ\HAML14XE\ROADCLOSURE.DGN

DETOUR ROUTE SIGN LAYOUT

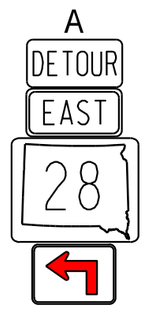
(Fixed Location, Ground Mounted, Breakaway Supports Signs)

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	10	23

Plotting Date: 08/16/2017



A



B

C

D

E

F

G

H

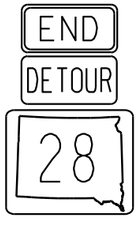
I

J

K

L

N



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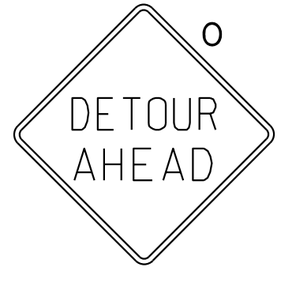


PLOT SCALE - 1:3400

PLOTTED FROM - TRAB10200

PLOT NAME - 2

FILE - ...\PRJ\HAML14XE\DETOURLAYOUT.DGN

The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

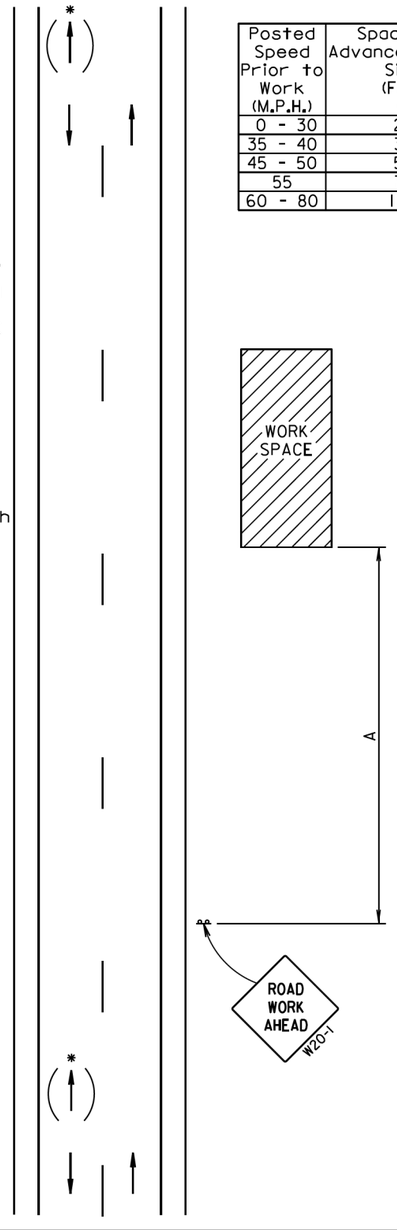
The signs illustrated shall be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 80	1000



April 15, 2015

Published Date: 3rd Qtr. 2017	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES WORK BEYOND THE SHOULDER	PLATE NUMBER 634.01
			Sheet 1 Of 1

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)	Spacing of Channelizing Devices (Feet) (G)
0 - 30	200	25
35 - 40	350	25
45	500	25
50	500	50
55	750	50
60 - 65	1000	50

Flagger

Channelizing Device

For low-volume traffic situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger may be used.

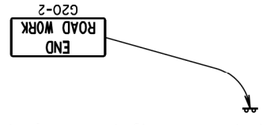
The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short duration operations (1 hour or less).

For tack and/or flush seal operations, when flaggers are not being used, the FRESH OIL sign (W21-2) shall be displayed in advance of the liquid asphalt areas.

Flashing warning lights and/or flags may be used to call attention to the advance warning signs.

The channelizing devices shall be drums or 42" cones.

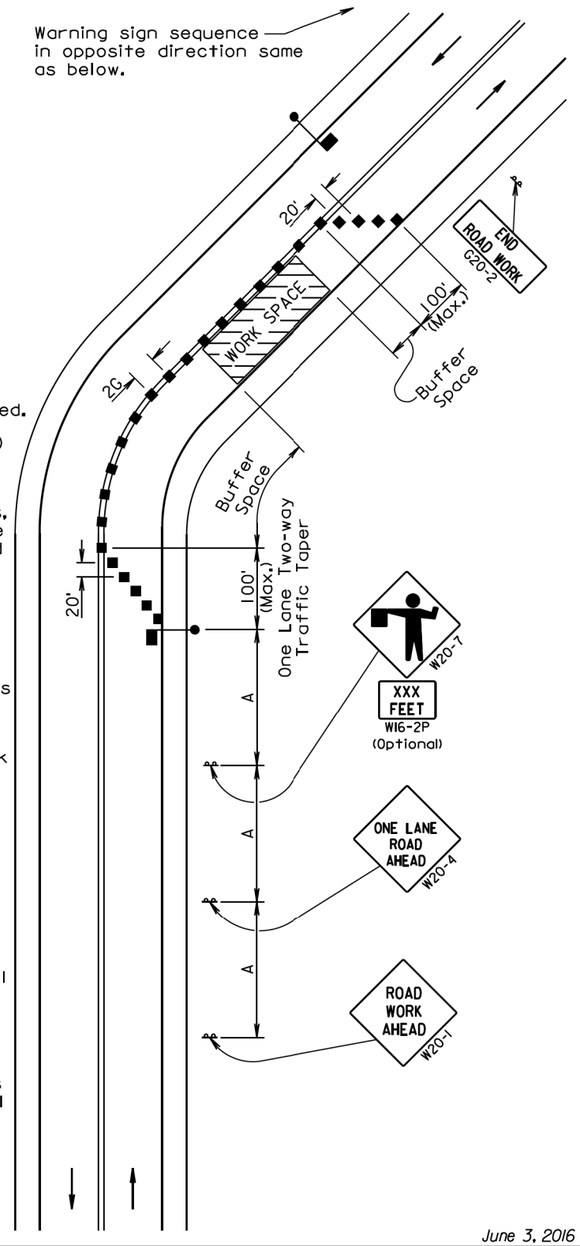
Channelizing devices are not required along the centerline adjacent to work area when pilot cars are utilized for escorting traffic through the work area.



Channelizing devices and flaggers shall be used at intersecting roads to control intersecting road traffic as required.

The buffer space should be extended so that the two-way traffic taper is placed before a horizontal or vertical curve to provide adequate sight distance for the flagger and queue of stopped vehicles.

The length of A may be adjusted to fit field conditions.



June 3, 2016

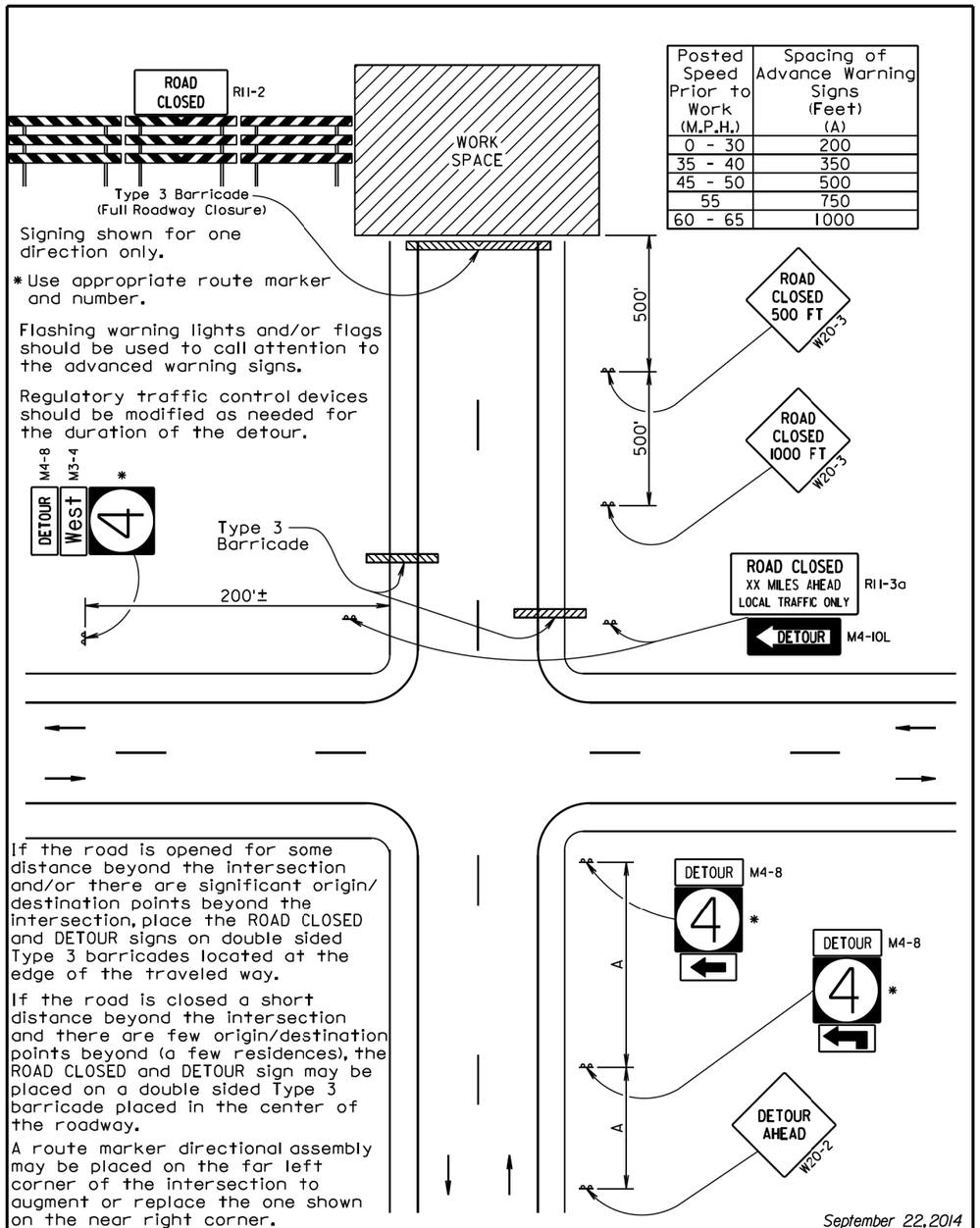
Published Date: 3rd Qtr. 2017	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES LANE CLOSURE WITH FLAGGER PROVIDED	PLATE NUMBER 634.23
			Sheet 1 of 1

PLOT SCALE - 1:200

PLOT NAME - 1

FILE - ...\PRJ\HAML14XE\63401_&_63423.DGN

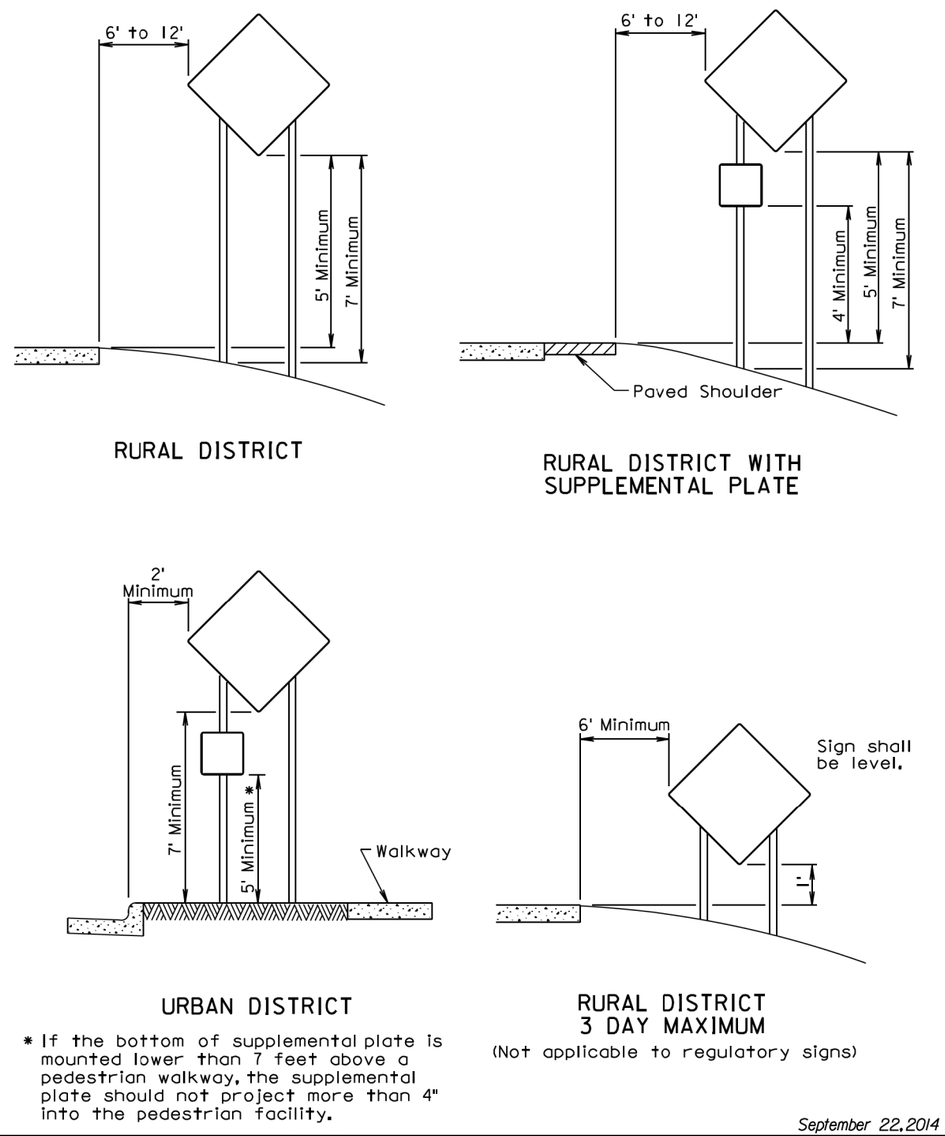
-PLOTTED FROM - TRAB17882



Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 65	1000

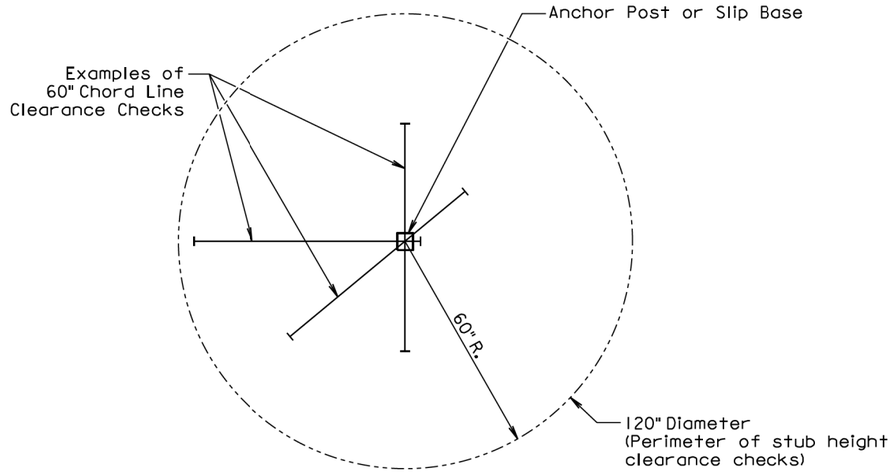
September 22,2014

Published Date: 3rd Qtr. 2017	SDDOT	GUIDES FOR TRAFFIC CONTROL DEVICES ROAD CLOSED WITH OFF-SITE DETOUR	PLATE NUMBER 634.29 Sheet 1 of 1



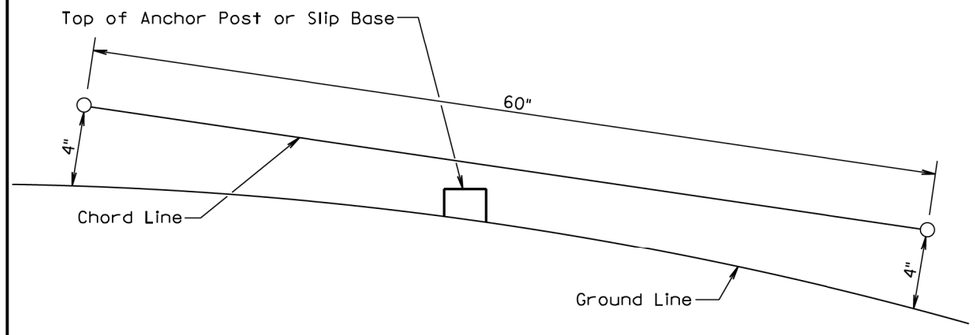
September 22,2014

Published Date: 3rd Qtr. 2017	SDDOT	CRASHWORTHY SIGN SUPPORTS (Typical Construction Signing)	PLATE NUMBER 634.85 Sheet 1 of 1



PLAN VIEW

(Examples of stub height clearance checks)



ELEVATION VIEW

GENERAL NOTES:

The top of anchor posts and slip bases SHALL NOT extend above a 60" chord line within a 120" diameter circle around the post with ends 4" above the ground.

At locations where there is curb and gutter adjacent to the breakaway sign support, the stub height shall be a maximum of 4" above the ground line at the localized area adjacent to the breakaway support stub.

The 4" stub height clearance is not necessary for U-channel lap splices where the support is designed to yield (bend) at the base.

July 1, 2005

Published Date: 3rd Qtr. 2017	SDDOT	**BREAKAWAY SUPPORT STUB CLEARANCE**	*PLATE NUMBER* 634.99
			Sheet 1 of 1

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R1-1	STOP	4	30"	5.2	20.8
R11-2	ROAD CLOSED	2	48" x 30"	10.0	20.0
R11-3a	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY	2	60" x 30"	12.5	25.0
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
W20-2	DETOUR AHEAD	3	48" x 48"	16.0	48.0
W20-3	ROAD CLOSED AHEAD	2	48" x 48"	16.0	32.0
W20-3	ROAD CLOSED 500 FT	2	48" x 48"	16.0	32.0
W20-4	ONE LANE ROAD AHEAD	2	48" x 48"	16.0	32.0
W20-7	FLAGGER (symbol)	2	48" x 48"	16.0	32.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			273.8

TYPE 3 BARRICADES

ITEM DESCRIPTION	QUANTITY
Type 3 Barricade, 6' Double Sided	2 Each
Type 3 Barricade, 8' Single Sided	10 Each

ITEMIZED LIST FOR DETOUR SIGNING

SIGN CODE	SIGN DESCRIPTION	CONVENTIONAL ROAD NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
M1-5	SD ROUTE MARKER (1 or 2 digits)	25	24" x 24"	4.0	100.0
M3-2	DIRECTION MARKER - EAST	12	24" x 12"	2.0	24.0
M3-4	DIRECTION MARKER - WEST	11	24" x 12"	2.0	22.0
M4-6	END	2	24" x 12"	2.0	4.0
M4-8	DETOUR	25	24" x 12"	2.0	50.0
M4-10L	DETOUR ARROW (L)	1	30" x 24"	5.0	5.0
M4-10R	DETOUR ARROW (R)	1	48" x 18"	6.0	6.0
M5-1L	ADVANCE TURN ARROW 90° (L)	4	21" x 15"	2.2	8.8
M5-1R	ADVANCE TURN ARROW 90° (R)	4	21" x 15"	2.2	8.8
M6-1L	DIRECTION ARROW - Horizontal Single Head (L)	4	21" x 15"	2.2	8.8
M6-1R	DIRECTION ARROW - Horizontal Single Head (R)	4	21" x 15"	2.2	8.8
M6-3	DIRECTION ARROW - Vertical Single Head	1	21" x 15"	2.2	2.2
		CONVENTIONAL ROAD DETOUR SIGNING SQFT			248.4

816+10
Take Out 48" - 64' RCP
& 2 Flared Ends
(Incidental Work, Grading)

816+10
Install 48" - 64' RCP
& 2 Flared Ends

816+18
Take Out 48" - 64' RCP
& 2 Flared Ends
(Incidental Work, Grading)

816+18
Install 48" - 64' RCP
& 2 Flared Ends

816+27
Take Out 48" - 64' RCP
& 2 Flared Ends
(Incidental Work, Grading)

816+27
Install 48" - 64' RCP
& 2 Flared Ends

816+36
Take Out 48" - 64' RCP
& 2 Flared Ends
(Incidental Work, Grading)

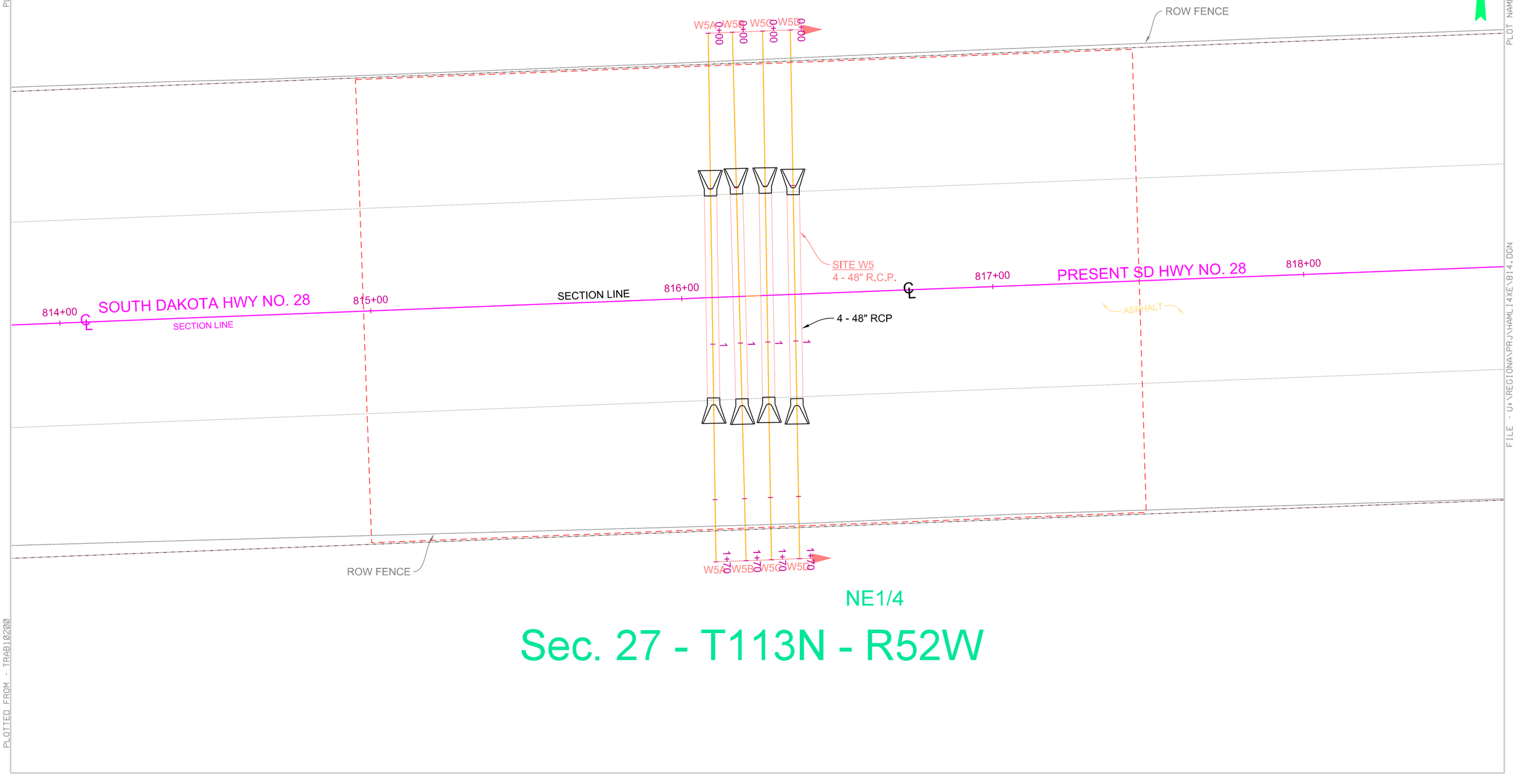
816+36
Install 48" - 64' RCP
& 2 Flared Ends

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	14	23

Plotting Date: 08/14/2017

Sec. 22 - T113N - R52W

SE 1/4



NE1/4

Sec. 27 - T113N - R52W

PLOT SCALE - 1:30

PLOT NAME - 5

FILE - U:\REGIONA\PRJ\HAML14XE\814.DGN

PLOTTED FROM - TRAB10200

EROSION AND SEDIMENT CONTROL LEGEND

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	15	23

Plotting Date: 08/14/2017

- Low Flow Silt Fence
- High Flow Silt Fence
- High Flow Silt Fence at Pipe
- Sediment Control at Inlet After Placement of Surfacing
- Sediment Control at Inlet Before Placement of Surfacing
- Temporary Sediment Barrier
- Temporary Water Barrier
- Floating Silt Curtain
- Sediment Filter Bags
- Triangular Silt Barriers
- Erosion Control Wattles on Slopes
- Erosion Control Wattles at Inlets
- Erosion Control Wattles in Ditches
- Erosion Bales
- Surfacing Roughening
- Temporary Grass Hay or Straw Mulch/ Soil Stabilizer
- Cut Interceptor Ditch
- Temporary Slope Drain
- Bonded Fiber Matrix/ Fiber Reinforced Matrix
- Rock Check Dam
- Type 1 Erosion Control Blanket
- Type 2 Erosion Control Blanket
- Type 3 Erosion Control Blanket
- Type 4 Erosion Control Blanket
- Type 1 Turf Reinforcement Mat
- Type 2 Turf Reinforcement Mat
- Type 3 Turf Reinforcement Mat
- Transition Mat
- Silt Trap (See Standard Plate 734.04)

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are split into three categories and are to be used throughout construction.

INITIAL PHASE

BMPs from the Legend shown as Orange Symbols on the Erosion and Sediment Control Plan Sheets are to be installed in the Initial Phase prior to earth disturbing activitles and remain in place for the Intermediate Phase for temporary stabilization and in the Final Phase to achieve final stabilization.

INTERMEDIATE PHASE

BMPs from the Legend shown as Blue Symbols on the Erosion and Sediment Control Plan Sheets are to be installed in the Intermediate Phase for temporary stabilization and remain in place in the Final Phase to achieve final stabilization.

FINAL PHASE

BMPs from the Legend shown as Green Symbols on the Erosion and Sediment Control Plan Sheets are to be installed in the Final Phase to achieve final stabilization.

If these items are applicable they are to be shown in the updated SWPPP using the Symbols given.

- TS — Topsoil Stockpile
- M — On-Site Construction Material Storage Area
- B — Borrow Area
- SK — Spill Kit
- CE — Stabilized Construction Entrance
- WP — Work Platform
- VB — Vegetated Buffer Strip
- CW — Concrete Washout
- AP — Asphalt Plant Site
- CP — Concrete Plant Site
- V — Vehicle and Equipment Parking, Fueling, and Maintenance Areas
- D — Dumpster or other Trash and Debris Containers

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	16	23
Plotting Date: 08/14/2017			

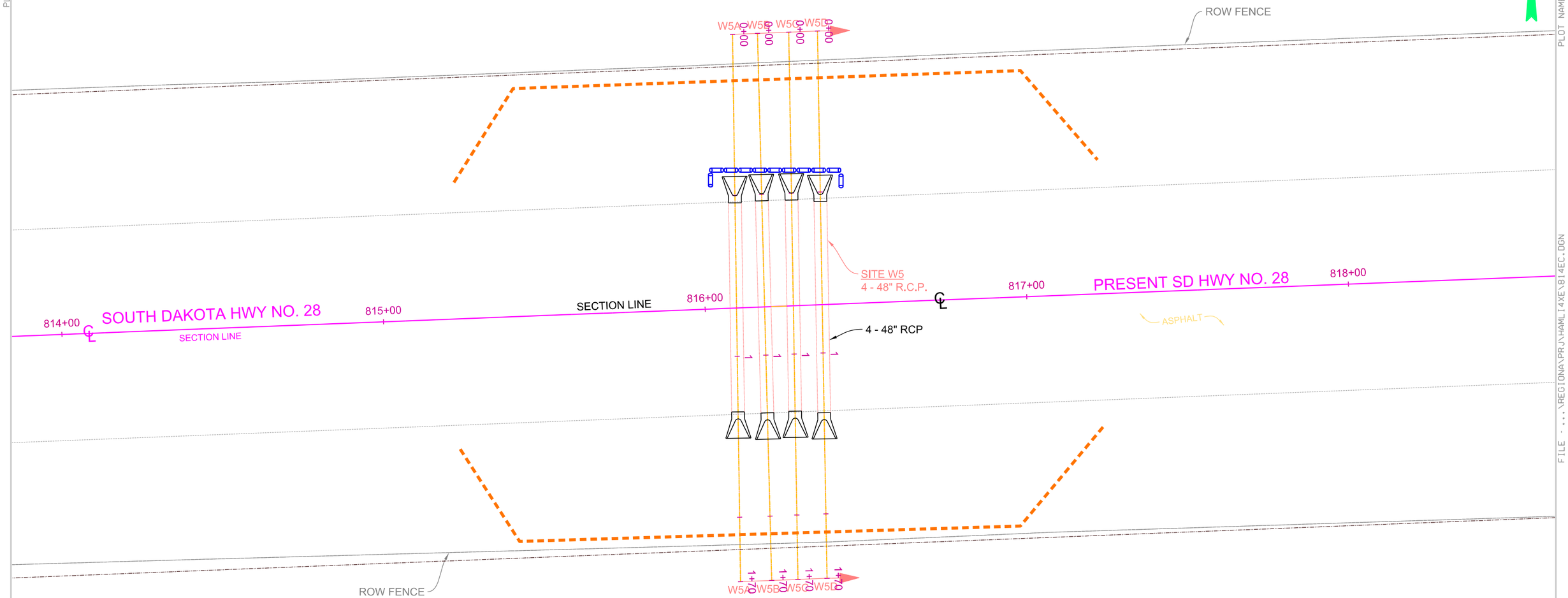
Install High Flow Silt Fence
at the following locations:
815+23L to 817+23L 240 Ft
815+23R to 817+23R 240Ft

Install 12" Diameter Erosion Control Wattles
at the following locations:
816+00L to 816+50L 70 Ft

Install Permanent Seeding and Mulching

Sec. 22 - T113N - R52W

SE 1/4



NE1/4

Sec. 27 - T113N - R52W

PLOT SCALE - 1:30

PLOT NAME - 7

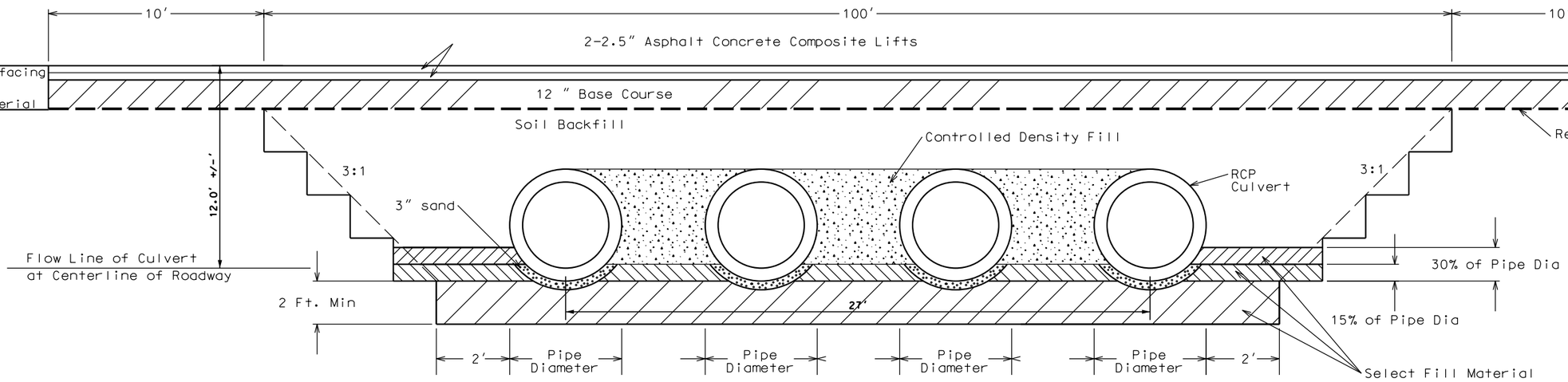
FILE - ...\REGIONA\PRJ\HAML14XE\814EC.DGN

PLOTTED FROM - TRAB10200

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	17	23
Plotting Date: 08/14/2017			

4-48" CULVERT REPLACEMENT DETAIL

Culvert Spacing 9' Center to Center



DRAWING NOT TO SCALE

PLOT SCALE - 1:4.6

PLOT NAME - 8

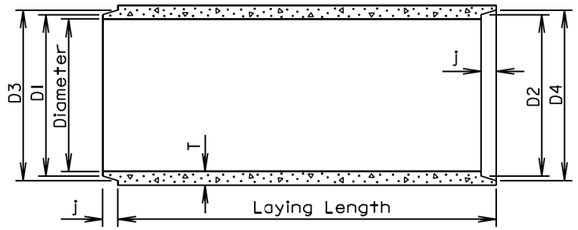
FILE - ...\14XE CULVERT DETAIL.DGN

PLOTTED FROM - TRAB10200

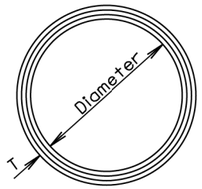
PLOT SCALE - 1:200

TOLERANCES IN DIMENSIONS

Diameter: ±1.5% for 24" Dia. or less and ±1% or 3/8" whichever is more for 27" Dia. or greater.
Diameters at joints: ± 3/16" for 30" Dia. or less and ± 1/4" for 36" or greater.
Length of joint (j): ± 1/4".
Wall thickness (T): not less than design T by more than 5% or 3/16", whichever is greater.
Laying length: shall not underrun by more than 1/2".



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

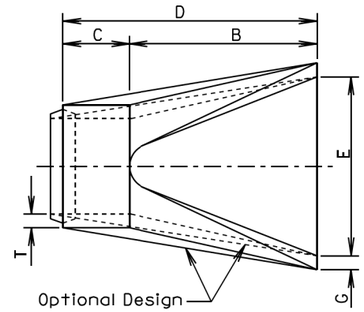
Construction of R. C. P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

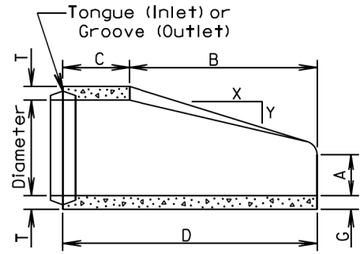
Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 7/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 1/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 7/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

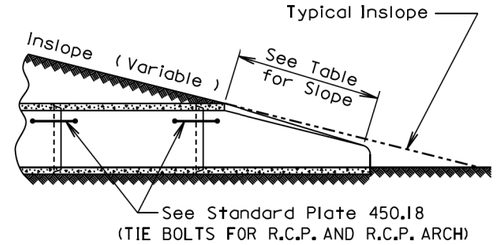
Published Date: 3rd Qtr. 2017	SDDOT	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

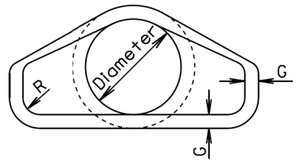


SLOPE DETAIL

GENERAL NOTES:

Lengths of concrete pipe shown on plan sheets are between flared ends only.

Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.



END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4: 1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4: 1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3: 1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4: 1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5: 1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5: 1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5: 1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5: 1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5: 1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5: 1	5	24	72	26	98	84	5	1 1/2
54	8240	2: 1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9: 1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7: 1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8: 1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8: 1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6: 1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5: 1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

June 26, 2015

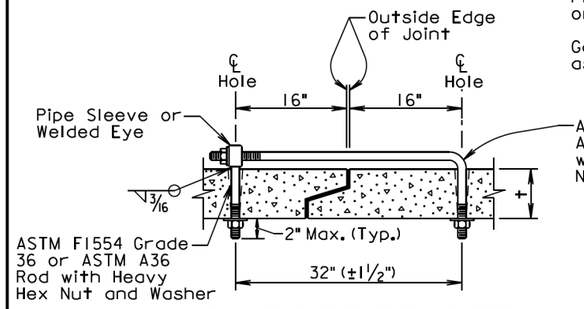
Published Date: 3rd Qtr. 2017	SDDOT	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1

PLOT NAME - 4

FILE - ...\PRJ\HAML14XE\45001_&_45010.DGN

-PLOTTED FROM - TRAB17892

Wall "t" (in.)	Rod Dia. (in.)	Pipe Sleeve Dia. (nominal)
≤ 3¼	⅝	¾
3½-6½	¾	1
≥ 7	1	1¼



ADJUSTABLE EYE BOLT TIE

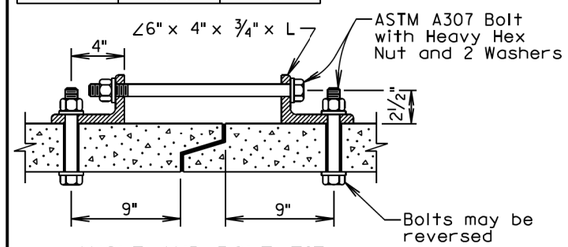
GENERAL NOTES:

Tie bolts shall conform to ASTM F1554 Grade 36 or ASTM A36. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Pipe Sleeve shall conform to ASTM A500 or A53, Grade B.

Galvanize adjustible eye bolt tie assembly in accordance with ASTM A153.

Pipe Dia. (in.)	"L" (in.)	Bolt Dia. (in.)
≤ 48	4	¾
> 48	6	1



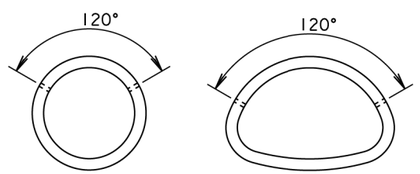
ANGLE AND BOLT TIE

GENERAL NOTES:

Angles shall conform to ASTM A36.

Bolts shall conform to ASTM A307. Nuts shall be heavy hex conforming to ASTM A563. Washers shall conform to ASTM F436.

Galvanize angles, bolts, nuts, and washers in accordance with ASTM A153.



END VIEW "CIRCULAR"

END VIEW "ARCH"

GENERAL NOTES:

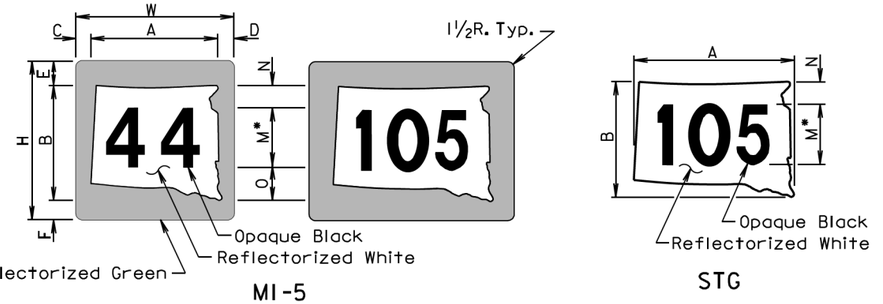
In lieu of the tie bolts detailed above other types of tie bolt connections may be installed as approved by the Office of Bridge Design.

All pipe sections of R.C.P. and R.C.P. Arch shall be tied with tie bolts except for pipe located between drop inlets, manholes, and junction boxes. All pipe sections of pipes that only enter or exit drop inlets, manhole, and junction boxes shall be tied with tie bolts.

There will be no separate measurement or payment for the tie bolts. The cost for furnishing and installing the tie bolts shall be incidental to the contract unit price per foot for the corresponding bid item for R.C.P. or R.C.P. Arch.

February 28, 2013

Published Date: 3rd Qtr. 2017	SDDOT	TIE BOLTS FOR R.C.P. AND R.C.P. ARCH	PLATE NUMBER 450.18
			Sheet 1 of 1



MI-5

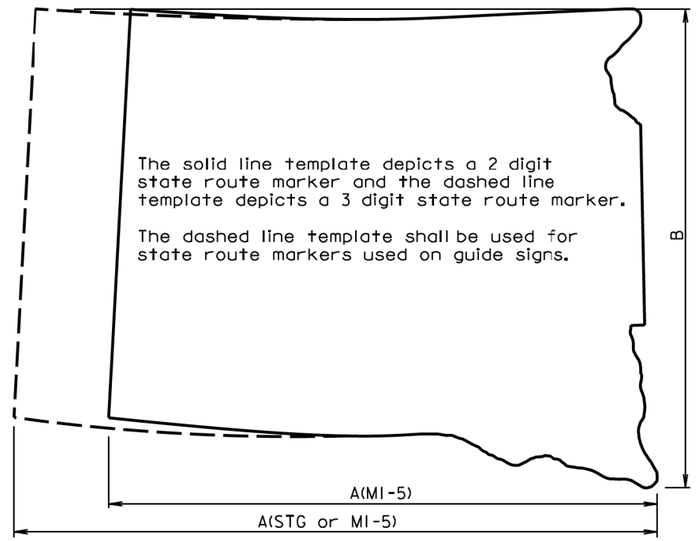
STG

SIGN CODE	WxH	A	B	C	D	E	F	M*	N	O
MI-5	24x24	20½	18	2	1½	3½	2½	12D	2	4
MI-5**	30x24	24	18	2¼	1¾	3½	2½	12D	2	4
MI-5	30x30	25⅝	22½	2½	1⅞	4⅜	3⅛	15D	2½	5
MI-5	36x36	30¾	27	3	2¼	5¼	3¾	18D	3	6

SIGN CODE	AxB	M*	N
STG-24	24x18	10D	4
STG-32	32x24	12D	4¾
STG-48	48x36	18D	7
STG-64	64x48	24D	9½

*In the few cases where there is not enough space for the numerals, the standard "D" series font may be replaced with "C" series font if approved by the Engineer.

**3 Digits



TEMPLATE FOR STATE ROUTE MARKER

GENERAL NOTES:

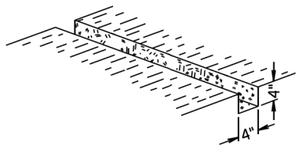
The unit for all dimensions shown is inches.

Numerals shall be "D" series font for all state route markers except as noted above.

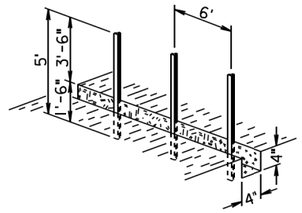
December 23, 2003

Published Date: 3rd Qtr. 2017	SDDOT	STATE ROUTE MARKERS	PLATE NUMBER 632.20
			Sheet 1 of 1

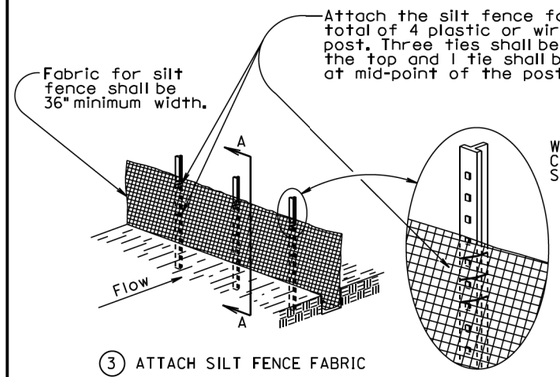
MANUAL HIGH FLOW SILT FENCE INSTALLATION



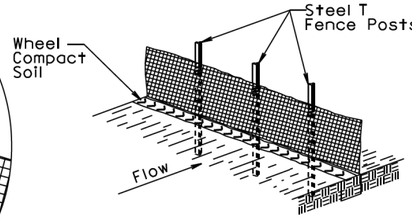
(1) EXCAVATE TRENCH



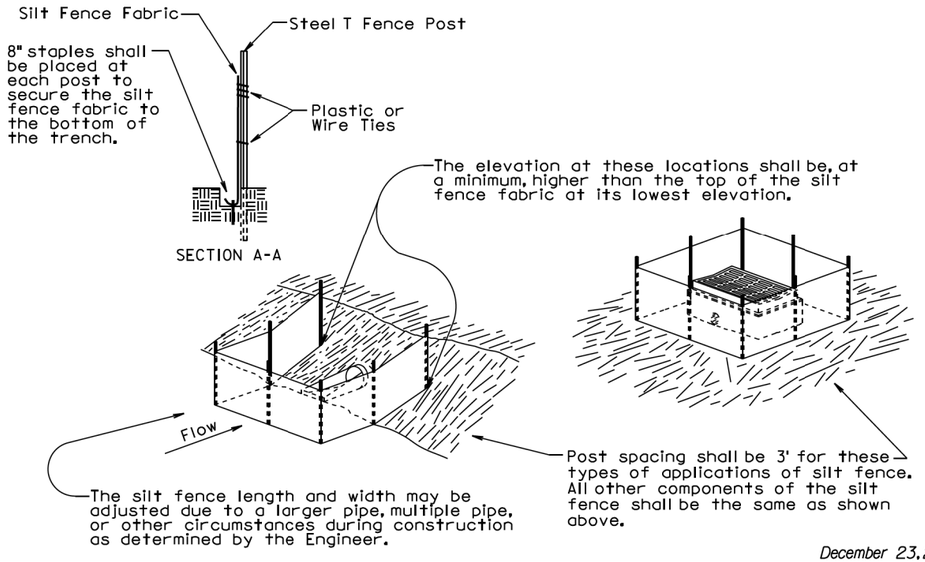
(2) DRIVE STEEL T FENCE POSTS



(3) ATTACH SILT FENCE FABRIC



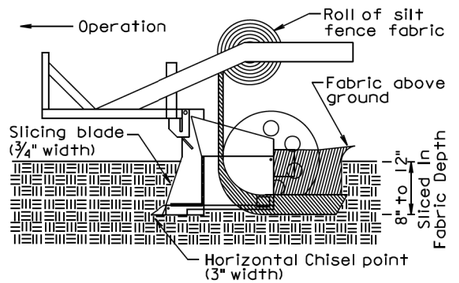
(4) BACKFILL TRENCH AND WHEEL COMPACT SOIL



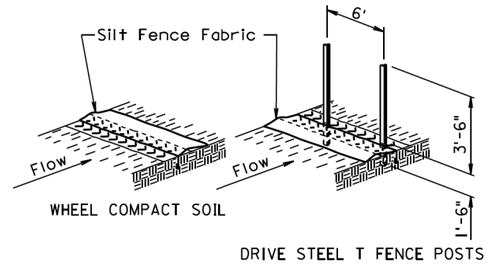
December 23, 2003

Published Date: 3rd Qtr. 2017	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 1 of 2

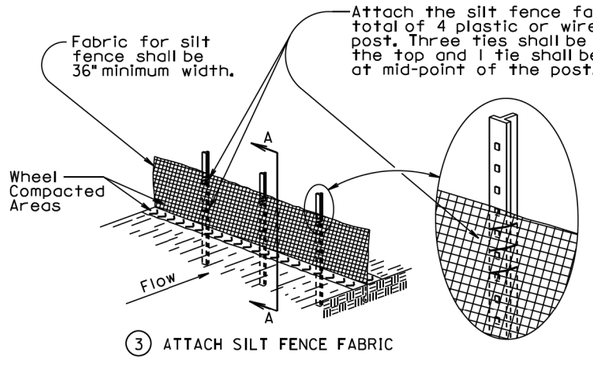
MACHINE SLICED HIGH FLOW SILT FENCE INSTALLATION



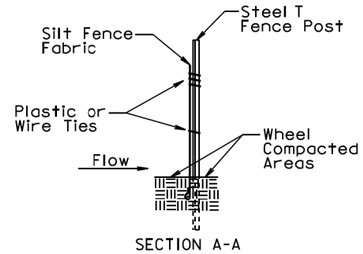
(1) INSTALL SILT FENCE FABRIC BY MACHINE SLICING METHOD.

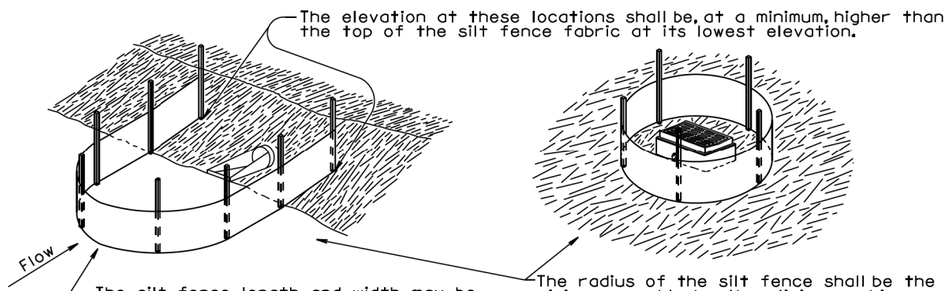


(2) WHEEL COMPACT SOIL ABOVE SLICED IN PORTION OF FABRIC AND THEN DRIVE STEEL T FENCE POSTS.



(3) ATTACH SILT FENCE FABRIC





GENERAL NOTE:

If a trench can not be dug or the silt fence fabric can not be sliced in due to the type of earthen material (such as rock), then a row of 30 to 40 pound sandbags butted end to end shall be provided on top of the extra length of silt fence fabric to prevent underflow.

December 23, 2003

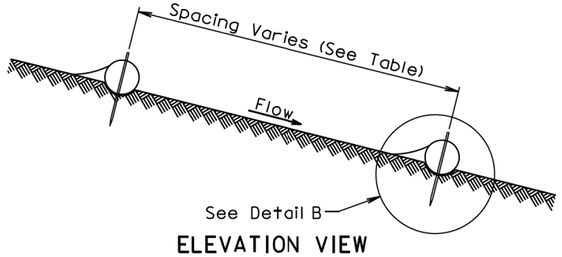
Published Date: 3rd Qtr. 2017	SDDOT	HIGH FLOW SILT FENCE	PLATE NUMBER 734.05
			Sheet 2 of 2

PLOT SCALE - 1:200

PLOTTED FROM - TRAB17882

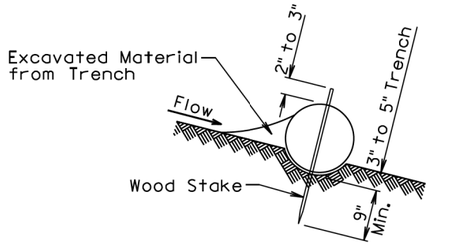
PLOT NAME - 6

FILE - ...\PRJVHAML14XE\73405_&_73405.DGN

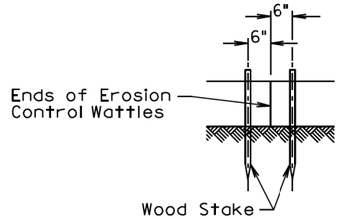


ELEVATION VIEW
CUT OR FILL SLOPE INSTALLATION

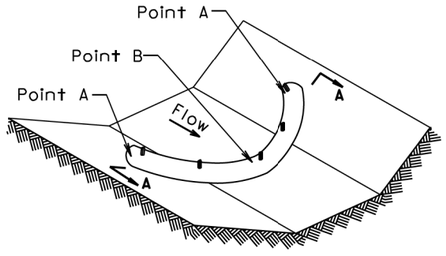
CUT OR FILL SLOPE INSTALLATION	
Slope	Spacing (Ft)
1:1	10
2:1	20
3:1	30
4:1	40



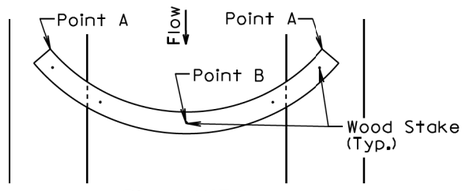
DETAIL B
(TYPICAL OF ALL INSTALLATIONS)



DETAIL C

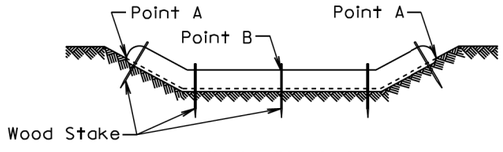


ISOMETRIC VIEW
DITCH INSTALLATION



PLAN VIEW
DITCH INSTALLATION

DITCH INSTALLATION	
Grade	Spacing (Ft)
2%	150
3%	100
4%	75
5%	50



SECTION A-A

December 23, 2004

Published Date: 3rd Qtr. 2017	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 1 of 2

GENERAL NOTES:

At cut or fill slope installations, wattles shall be installed along the contour and perpendicular to the water flow.

At ditch installations, point A must be higher than point B to ensure that water flows over the wattle and not around the ends.

The Contractor shall dig a 3" to 5" trench, install the wattle tightly in the trench so that daylight can not be seen under the wattle, and then compact the soil excavated from the trench against the wattle on the uphill side. See Detail B.

The stakes shall be 1"x2" or 2"x2" wood stakes, however, other types of stakes such as rebar may be used only if approved by the Engineer. The stakes shall be placed 6" from the ends of the wattles and the spacing of the stakes along the wattles shall be 3' to 4'.

Where installing running lengths of wattles, the Contractor shall butt the second wattle tightly against the first and shall not overlap the ends. See Detail C.

The Contractor and Engineer shall inspect the erosion control wattles once every week and within 24 hours after every rainfall event greater than ½". The Contractor shall remove, dispose, or reshape the accumulated sediment when necessary as determined by the Engineer.

Sediment removal, disposal, or necessary shaping shall be as directed by the Engineer. All costs for removing accumulated sediment, disposal of sediment, and necessary shaping shall be incidental to the contract unit price per cubic yard for "Remove Sediment".

All costs for furnishing and installing the erosion control wattles including labor, equipment, and materials shall be incidental to the contract unit price per foot for the corresponding erosion control wattle bid item.

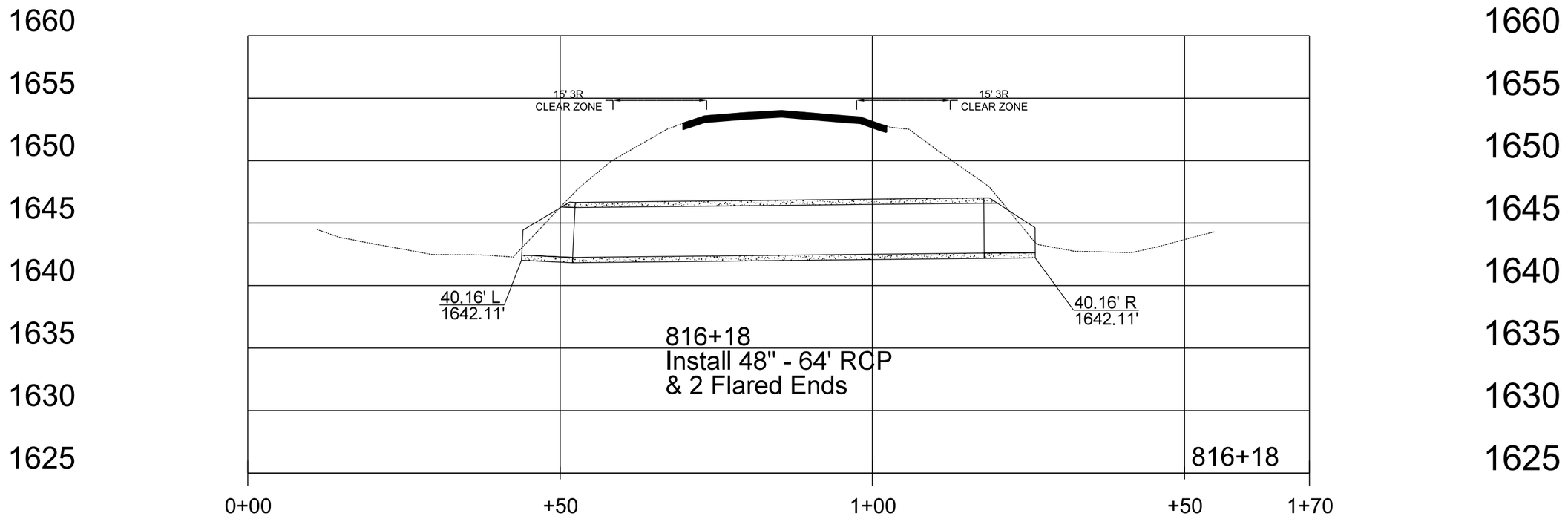
All costs for removing the erosion control wattle from the project including labor, equipment, and materials shall be incidental to the contract unit price per foot for "Remove Erosion Control Wattle".

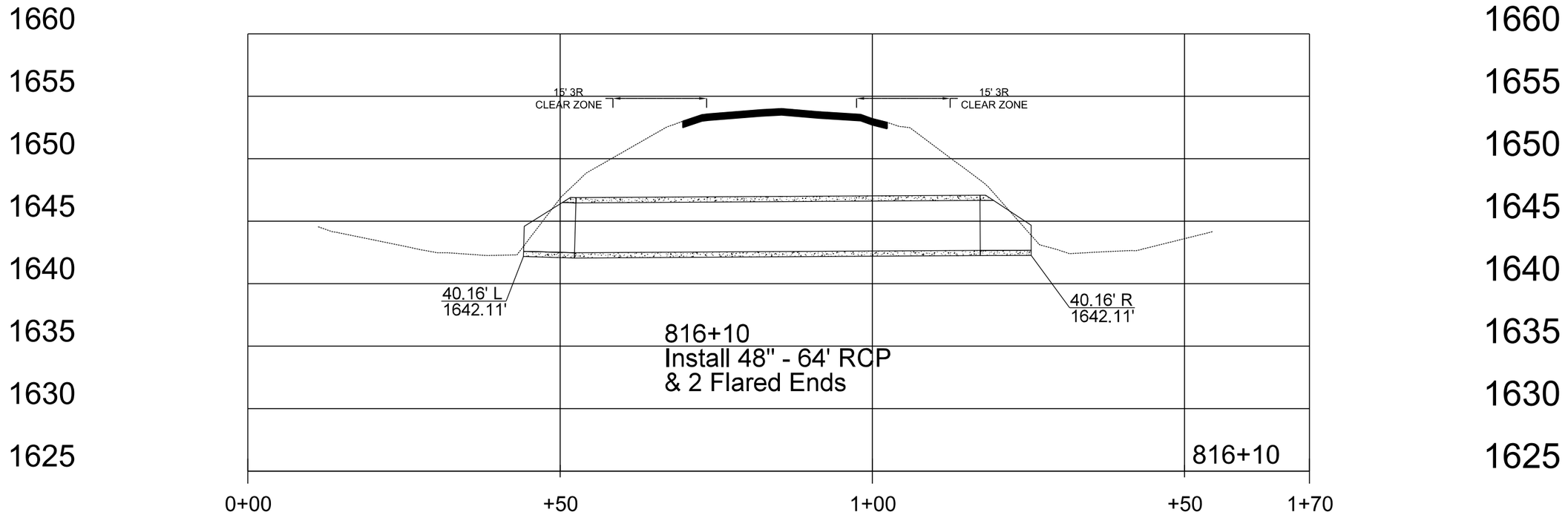
December 23, 2004

Published Date: 3rd Qtr. 2017	SDDOT	EROSION CONTROL WATTLE	PLATE NUMBER 734.06
			Sheet 2 of 2

Plotting Date: 08/14/2017

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	22	23





Plotting Date: 08/14/2017

STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	028-171	23	23